Department of LABOR AND INDUSTRIES

SHARP Safety & Health Assessment & Research for Prevention 1-888-66-SHARP

Occupational Lead Exposure:

A Health Care Provider Alert

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Introduction

Although the toxic effects of lead have been known for centuries, many workers in the U.S. are overexposed and poisoned in their workplaces. This pamphlet is designed to help you work with the Department of Labor & Industries (L&I) to prevent lead poisoning among Washington's working men and women – and their children.

The Physician's Role and the Law

The lead standards

Washington State's occupational health and safety regulations give physicians primary responsibility for evaluating lead toxicity in workers who are patients. There are two standards that apply to workplace lead exposures: the "Lead Standard for General Industry" (WAC 296-62-07521) and the "Lead in Construction Standard" (WAC 296-155-176).

Under these standards, employers are required to provide medical evaluations for lead-exposed workers. Employees should receive a written report detailing the fitness for duty and any special equipment required, limitations, or restrictions from performing job duties. Employers are required to provide a copy of the appropriate regulations to the health care provider.

Employees should be **medically removed** (transferred to a non-lead exposed job without loss of pay or benefits) from the worksite if:

- Blood lead levels (BLLs) exceed 50-60 µg/dl (the precise level depends on which standard is applicable); or
- Medical conditions place the employee at increased risk of impairment of health due to lead exposure (e.g. renal disease, pregnancy, plans to have children).

Biological monitoring

Employers must establish a medical surveillance program for employees who are or may be exposed to airborne lead levels above 30 $\mu g/m^3$ of air, averaged over an eight-hour period for more than 30 days per year. Periodic BLL and zinc protoporphyrin tests must be offered to workers. The specific biological monitoring requirements of the lead standards are summarized in SHARP's publication: "Washington State's Standards for Occupational Exposure to Lead."

The Lead Registry: A Prevention Effort

In July 2000, the Washington State Board of Health adopted a revised Reportable Conditions Rule (WAC 246-101). Included in this rule is the requirement that in-state testing laboratories report all blood lead tests to the Washington State Department of Health (DOH).

Washington physicians who send blood for analysis directly to laboratories *outside of the state* should report these levels to DOH:

Department of Health
Lead Surveillance Program
PO Box 47812
Olympia WA 98504-7812
Phone: 1-800-909-9898

The Safety & Health Assessment & Research for Prevention (SHARP) program at L&I follows up on the elevated blood lead levels and maintains the Occupational Lead Exposure Registry. This registry has operated since May 1993, and serves to pinpoint hazardous jobs and design strategies to prevent overexposures**. Lead poisoning is a completely preventable disease.**

Whenever you request lead testing, please provide the following patient information to the laboratory:

- ✓ name,
- ✓ address (including county),
- ✓ sex,
- ✓ race & ethnicity,
- ✓ employer,
- ✓ occupation, and
- ✓ age or date of birth.

You can also provide invaluable assistance to the lead registry by encouraging your patients to complete SHARP's **Blood Lead Testing (BLT) form**. The BLT is designed to track the industries and occupations in which lead overexposure occurs and gather other important demographic information. **This form eliminates time-consuming and costly telephone follow-up with health care providers, laboratories, patients, and employers.**

You may obtain a blank BLT form by downloading a copy from our web site at *www.lni.wa.gov/sharp/reportable/Lead.htm#BLT* or calling SHARP at 1-888-66-SHARP.

Completed BLT forms may be faxed to 360-902-5672 or mailed to:

Lead Surveillance
SHARP Program
PO Box 44330
Olympia WA 98504-4330

Stamped addressed envelopes are available upon request.

Your cooperation will greatly assist the state's effort in tracking and preventing lead poisoning and overexposure.

Medical Evaluation of Workers

A comprehensive physical examination and screening blood tests are recommended components in the evaluation of a lead-exposed worker. Medical surveillance guidelines are provided in the lead standards. Suggestions for additional medical guidelines are provided on the last page of this pamphlet.

There is generally recognized to be no known threshold for lead's health effects, and blood lead levels once considered safe are now considered potentially harmful. BLLs in the 20-39 µg/dl range have been associated with reproductive health effects (neuropsychological effects in children born to exposed women), hypertension, and renal dysfunction.

In their "Healthy People 2010" document, the U.S. Department of Health and Human Services set the following national goals for blood lead levels:

Children: < 10 mg/dl
Adults working with lead: < 25 mg/dl

If you see a case of lead poisoning or overexposure, it may not be an isolated incident! Find out if other workers are exposed or if small children may be at risk, either at the exposure source or through carry-home dust.

Lead in the Workplace

The following jobs and work activities have been associated with lead poisoning:

General industry:

- Lead production or smelting
- Brass, copper, or lead foundries
- Lead fishing weight production
- Thermal stripping or sanding of old paint
- Welding or cutting of old painted metal
- Machining and grinding lead alloys
- Battery manufacturing and recycling
- Radiator manufacturing and repair
- Scrap metal handling
- Lead soldering
- Indoor firing ranges
- Ceramic glaze mixing

Construction jobs/tasks:

- Home renovation/remodeling
- Demolition of old structures
- Steel bridge maintenance
- Welding or cutting of old painted metal
- Thermal stripping or sanding of old paint

Lead away from Work

Workers may carry lead dust home on their work clothes, work shoes, or areas of the body not covered by protective clothing such as hands or hair. Young children are very sensitive to lead's harmful effects. If a pregnant woman is exposed to lead, it may harm her unborn child.

Sources of lead in the environment include:

- Paint on houses built before 1978 and soil contaminated with paint dust and chips.
- Drinking water contaminated by lead solder.
- Soil and air near buildings where people work (or have worked) with lead.
- Soil in areas where lead-containing pesticides had been used.

Some hobbies that have been associated with lead poisoning include creating leaded glass pieces, using pottery glazes containing lead, firearm use (especially at indoor ranges), and pouring fishing weights.

Blood Lead Levels and Health Effects

Effects of Inorganic Lead on Adults: Lowest Observable Adverse Effect Levels

BLL (µg/dl)	Health Effects in Adults
100	Encephalopathy Frank anemia
50	Decreased longevity Decreased hemoglobin synthesis
40	Peripheral neuropathies Infertility (men)
30	Decreased renal function Increased systolic blood pressure (men) Decreased hearing acuity
20	Increased erythrocyte protoporphyrin (men) Increased erythrocyte protoporphyrin (women) Fetal effects (in pregnant women)
10	Increased hypertension (?) ALA-D inhibition

Adapted from: Clinical Evaluation and Management of Lead-Exposed Construction Workers (2000)

To put these levels in perspective:

- "Elevated" BLL in the registry: $\geq$ 25 µg/dl
- Medical removal: 50-60 µg/dl

For More Information

L&I's SHARP Program

The Safety & Health Assessment & Research for Prevention (SHARP) program performs research and analysis of workplace health and safety issues. SHARP administers the Occupational Lead Exposure Registry and can provide further information on work-related lead poisoning to interested employers, workers, and health professionals. Call 1-888-667-4277 or (360) 902-5669. Visit SHARP's notifiable conditions/lead surveillance web page at *www.lni.wa.gov/sharp/reportable/Lead.htm*

L&I's WISHA Services

WISHA enforces the lead standards and also offers free assistance and information to both employers and employees upon request. WISHA also investigates complaints from workers and concerned health care providers. Call 1-800-4BESAFE (1-800-423-7233). Visit WISHA's web site at *www.lni.wa.gov/wisha.*

The Washington State Department of Health

The Department of Health provides information and assistance for cases of lead overexposure in children. Call 1-800-909-9898.

Other Useful Resources

Harborview Medical Center

The University of Washington Occupational Medicine Program at Harborview is the Pacific Northwest training site for occupational medicine professionals and is available for consultation to other health care providers:

University of Washington Occupational Medicine Program, Box 359739
Seattle WA 98104
(206) 341-4446

The Agency for Toxic Substances and Disease Registry (ATSDR)

ATSDR provides a free booklet on lead poisoning that qualifies for CME credit, Case Studies in Environmental Medicine – Lead Toxicity. The booklet is available from SHARP or:

Continuing Education Coordinator
Agency for Toxic Substances and Disease Registry
Division of Health Education, E33
1600 Clifton Road
Atlanta GA 30333
(404) 639-5015

The National Institute for Occupational Safety and Health (NIOSH)

NIOSH provides funding for 28 states to maintain blood lead registries. For a national perspective on lead surveillance and prevention, visit NIOSH's Adult Blood Lead Epidemiology and Surveillance (ABLES) program web site at *www.cdc.gov/niosh/ables.html* or call 1-800-35-NIOSH.

The Environmental Protection Agency (EPA) – Region 10

EPA's lead program focuses on childhood exposures and lead-based paint. Visit the Region 10 web site at *www.epa.gov/r10earth/index.htm* or call 1-800-424-4EPA.

Medical Guidelines

"Clinical Evaluation and Management of Lead-Exposed Construction Workers," S.M. Levin & M. Goldberg, AJIM, 2000, 37, 23-43.

"The Lead Exposed Worker," D. Rempel, JAMA, 1989 262(4), 532-534.